REMARKS/ARGUMENTS

Claims 1-7, 9-16 and 18 remain pending. Claims 19 and 20 are new to add in the claims. Applicant respectfully requests reconsideration in light of the following remarks.

Claim Rejections -35 USC 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the difference between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negative by the manner in which the invention was made.

Rejection of Claims 1and 10 under 35 U.S.C. 103(a)

Claims 1 and 10 are rejected under 35 USC 103(a) as being unpatentable over Wakabayashi et al. (US 2004/0047419) in view of Huang et al. (US 2003/0185446). Applicants respectfully traverse the rejection for the following reasons.

Wakabayashi et al.

In examiner's opinion, Wakabayashi et al. teaches that (a) the image frame F(x) is divided into a plurality of blocks (para. [0062],[0063]); (b) ALD is stored in RAM (fig 6. ref label S46); (c) if ALD is greater than Th0, then B(x)jj is determined to be moving (fig 6. ref label S47); (d) grouping said blocks into an adjacent region thereof, whereby changed blocks can be regionally grouped together (Fig.10

and 11); and (e) calculating a difference value (LD), whereby the flicker noise does not affect the motion detection (para. [0089]) (Fig. 10 and 11, para [0118]-[0127]).

Huang et al.

Huang et al. teaches that deviation (normalized error) for region is calculated by dividing the sum of the absolute difference for all sub-regions by sum of the average values for all sub regions.

The Claimed Invention

The claimed invention is directed to provide a method and a medium for detecting motion and filtering noise with clear divided blocks (shown in claims 2 and 11) and two clear thresholds (shown in claims 6,15 and 9,18 respectively). The detailed procedures for detecting motion are (a) dividing an incoming image into a plurality of blocks. (b) comparing said plurality of blocks to corresponding blocks of a referred image and saving compared results into a declared data structure; (c) marking a compared result that exceeds the first predetermined threshold which is preferably 1, and whereby a changed block corresponding to said compared result can be indicated; (d) combining said compared result into an adjacent region thereof, whereby changed blocks can be regionally combined together; and (e) calculating a deviation value of said region and comparing said deviation value to the second predetermined threshold which is preferably 0.35 and whereby the motion in images can be detected and the noise can be filtered out by finding out if noise interference exists.

Argument

In fig 6. ref label S46 of Wakabayashi et al., it mentions that **ALD** stored in RAM is similar to the **compared results** saves into a declared data structure mentioned in the present invention. However, ALD is the absolute luminance difference of frame luminance

differences and block luminance differences (para [0022]) ($ALD = |\Delta BLrep(X)ij - \Delta FLrep(X)|$), but the compared result is made by comparing blocks of an incoming image to corresponding blocks of a referred image (step (b) of claim 1). In Wakabayashi et al., ALD is the difference of frame differences and block differences, but the compared result in Claim 1 is the difference of two blocks. Therefore ALD and the compared results mentioned above **are different**. In another words, it is not apparent that the compared results can be taught by ALD mentioned in Wakabayashi et al..

In fig 6. ref label S47 of Wakabayashi et al., if ALD is greater than Th0, then B(x)jj is determined to be moving. However, in the present invention, a compared result is marked, if it exceeds a first predetermined threshold in the present invention. In the step (C) of the present invention, if a compared result exceeds a first threshold, it is **not determined to be moving directly, but only marked**. Therefore, the two actions are apparently different.

In para. [0089] and Fig. 10 and 11, para [0118]-[0127] of Wakabayashi et al., it **doesn't mention a second determined threshold**. But in step (e) of the present invention, it clearly expresses that calculating the deviation value of the region which the compared result is grouped in and comparing the deviation value to **a second threshold**. Therefore, the step (e) of the present invention is not taught by Wakabayashi et al.. In the present invention, the second threshold which is smaller than the first threshold in the claim 2 of Wakabayashi et al. is to replace the first threshold. **It does not to compare the ALD value with two different thresholds two times.** In another words, the ALD will just compare with only **one threshold at** one time. But in the present invention, there are **two thresholds** in the process of motion detection. In Figure 7 of Wakabayashi et al., it shows that the Th0 of Figure 6 can be replaced by Th1 or Th2 or Th3. Those thresholds are classified by sensitivity.

On the other hand, Huang et al. teaches that deviation (normalized error) for region is calculated by dividing the sum of the

absolute difference for all sub-regions by sum of the average values for all sub regions. But the **average values** in numerator and denominator **are different**. The average value in numerator is from the average of T(i) and the average value in denominator is from the average of R(i). To clearly realize this point, we can see the description of paragraph [0057] in Huang et al.: A normalized error(i) for region **T(i)** is calculated, e.g., by dividing the sum of the absolute differences for all sub-regions in T(i) by the sum of the average values for all sub-regions in **R(i)**..... We can see that **T(i)** is a sub-region of a **test image** and **R(i)** is a sub-region of a **reference image**. But in the present invention, the average values in numerator and denominator are the same ($\mathbf{x_{avg}}$).

In fact, the two claims were the cancelled claims 8 and 17 before. According to the amendment described above, Huang et al. didn't exactly teach the equation. In the first office action, **the examiner thought that the independent claims were patentable if claims 8 and 17 were added in the independent claims. However, in the second office action, the reason that in the first office action to add the equation (claims 8 and 17) in the independent claims 1 and 10 was not existed.** Therefore, the applicant had omitted the equation in claims 1 and 10 and added the new dependent claims 19 and 20 in this amendment. The applicant hopes that the change is allowed. The applicant also expects that the examiner can reconsider the patentability. It is clear that Huang et al. does not teach the equation exactly.

By summarizing the viewpoints mentioned above, the Wakabayashi et al. does not teach claims 1 and 10 of the present invention. Therefore, the applicant believes that the amended claims 1 and 10 are patentable.

Rejection of Claims 2 and 11 under 35 U.S.C. 103(a)

Claims 2 and 11 are rejected under 35 USC 103(a) as being unpatentable over Wakabayashi et al. (US 2004/0047419) in view of Ozaki (US 6,393,153).

Wakabayashi et al. teaches all the limitations of claim 1 as applied above from which claim 2 respectively depend. Ozaki teaches that size of block of image is 8x8 or 16x16.

Ozaki

Ozaki teaches that size of block of image is 8x8 or 16x16.

Argument

Wakabayashi et al. only mentions **unclear divided blocks** about its incoming image. The present invention is not only to divide an incoming image into a plurality of blocks, but also to set **the size of each block ranging from 1% to 4%** of the whole image to reduce the complicated calculations and optimize the exactitude of judgment whether the incoming image is a motion image or not.

If the block size is larger, the amount of operations can be reduced more but the accuracy of detecting motion will be lower. If the block size is smaller, then the accuracy of detecting motion will be higher but the amount of operations will be less reduced.

Therefore, it is not easy to choose a block size which is preferably 1%~4% of the incoming image. The benefits of the choice are that the amount of operations can be reduced properly and the accuracy of detecting motion can be satisfying.

Wakabayashi et al. does not teach that each of the plurality of blocks is 1%~4% of said incoming image. Though Ozaki teaches that size of block of image is 8x8 or 16x16, it can't prove that the size can effectively reduce the amount of operations or improve the accuracy of detecting motion.

The size of block of image is an important know-how. Because different select of each block size of the image will affect the calculation complexity and the motion judgment exactitude. We should select each block size properly to reach a balance of **reducing**

calculations effectively and **improving the motion judgment apparently**. Therefore setting each block size from 1% to 4 % of an incoming image is unobvious to a person of ordinary skill in the art.

Rejection of Claims 3-6 and 12-15 under 35 U.S.C. 103(a)

Claims 3-6 and 12-15 are rejected under 35 USC 103(a) as being unpatentable over Wakabayashi et al. (US 2004/0047419) in view of Shiiyama (US 7,075,683).

Wakabayashi et al. teaches all the limitations of claim 1 as applied above from which claims 3 and 6 respectively depend. Shiiyama teaches detection using average of sum of square of the difference and teaches fixed threshold (col. 13 lines 3-10).

Argument

To use a fixed threshold is not hard to figure out, but to select an exact value for a threshold is not easy. The present invention recommends that the first threshold should be set to 1 (in claim 6). It is not taught by Wakabayashi et al. or Shiiyama . On the other hand, though Shiiyama's invention mentions the using of average of sum of square of the difference (col. 13 lines 3-10), it doesn't give a clear algorithm to show how to get the compared results.

Rejection of Claims 7 and 16 under 35 U.S.C. 103(a)

Claims 7 and 16 are rejected under 35 USC 103(a) as being unpatentable over Wakabayashi et al. (US 2004/0047419) in view of Liu et al. (US 2004/0233197).

Wakabayashi et al. teaches all the limitations of claim 1 as applied above from which claims 7 and 16 respectively depend. Liu et al. teaches that group is employed by a double linked list.

Argument

A double linked list used in the present invention is emphasizing on its application, not on its prior technology.

Rejection of Claims 9 and 18 under 35 U.S.C. 103(a)

Claims 9 and 18 are rejected under 35 USC 103(a) as being unpatentable over Wakabayashi et al. (US 2004/0047419).

With respect claim 9, Wakabayashi et al. discloses all the limitations of claim 1 as applied above from which claim 4 respectively depend. At the time of the invention it would have been obvious to a person of ordinary skill in the art to use predetermined threshold.

Argument

In claim 1 of the present invention, the second predetermined threshold is utilized to compare with the deviation values to judge if the incoming image is a motion image or it is interfered by noise. Therefore, providing an exact value for the second threshold is necessary.

Without specifically mentioning in dependent claims, it is submitted that these claims are patentable not only by virtue of their dependency on their respective base claims, but also for the totality of features recited therein.

Nevertheless, to accelerate the application to advance to issue, claims 1 and 10 have been amended to incorporate the limitation of the claims 2 and 11 respectively. Claims 19 and 20 are new. In view of the amendment and the point in the Allowable Subject Matter section of current Office Action, all pending claims 1-7, 9-16, and 18-20 should be in condition for allowance.

CONCLUSION

In light of the above amendments and remarks, Applicants respectfully submit that Claims 1-7, 9-16, and 18-20 as currently presented are in condition for allowance. Accordingly, reconsideration is respectfully requested.

This Amendment was prepared by Applicant, and is being submitted without substantive change by the undersigned Attorney.

Respectfully submitted,
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